VIRGINIA DROUGHT MONITORING TASK FORCE

Drought Status Report

September 22, 2009

Statewide precipitation for the period from October 1, 2007 through September 18, 2009 was in the normal range (93% of normal). Normal precipitation is defined as the mean precipitation for a thirty year period of record for the area. Precipitation greater than 85% of normal is considered to be in the normal range. No drought evaluation regions were below the normal range for this time period although precipitation deficits still persist in eleven of the thirteen drought evaluation regions. Only the Southeast Virginia and Eastern Shore drought evaluation regions have received precipitation above 100% of normal for this time period. Statewide precipitation for the current water year (from October 1, 2008 through September 18, 2009) is within the normal range (93%). Precipitation is now within the normal range for all drought evaluation areas for the current water year with the exception of the Middle James (84%). Statewide precipitation from August 1st through September 18, 2009 was below the normal range (83%), with four drought evaluation regions receiving precipitation greater than 100% of normal and nine drought evaluation regions receiving below 100% of normal. Appendix A contains precipitation tables for periods dating from October 1, 2007 provided by the Climatology Office of the University of Virginia.

The National Weather Service Climate Prediction Center 6-10 day climatologic outlooks call for above normal precipitation and below normal temperatures for the Commonwealth. Temperatures are expected to be below normal and precipitation is expected to be in the normal range over the 8-14 day period. The three month outlook calls for equal chances of below normal, normal and above normal precipitation and temperatures for the Commonwealth through the middle of December 2009.

The latest NOAA drought monitor indicates "abnormally dry" conditions exist in portions of south central Virginia and southeastern Virginia along the North Carolina border. The total area experiencing "abnormally dry" conditions has increased over a three month period from less than 1% to approximately 4% of the Commonwealth's land area. The U.S. National Drought Monitor is included as Appendix B. Appendix C contains information from the national drought monitor with only Virginia displayed. No changes are forecasted for any part of Virginia in the Seasonal Drought Outlook for the United States from now through December 2009 (see Appendix D).

While the Virginia Department of Health has not reported any impacts to public water supplies that have compromised their ability to provide the needs of their customers, 22 systems are under voluntary water conservation requirements and 2 systems are under mandatory water conservation requirements. The number of systems under restrictions has been reduced by one since August 2009. Of the 46 systems listed in the VDH report, 6 have been rated as having a "Better" overall water supply situation, 1 has been rated as having a "Worse" overall water supply situation and all other systems are reported as being in a "Stable" situation. Appendix E contains a table of waterworks from this month's report, which includes systems that are under water conservation requirements.

The Virginia Department of Forestry (VDOF) reports light fire activity in September 2009. From January 1st through September 18th, the VDOF responded to 856 wild land fires that burned 6,947 acres. Since the August 20, 2009 Drought Status Report, 7 wild land fires that burned 19 acres were reported. Fire activity is anticipated to increase into October and November during the typical fall wildfire season.

The Department of Game and Inland Fisheries reports that water supply flows at the trout hatcheries are much improved over what they have been in the past few years for the end of summer period. The increased flows, along with the cooler summer have resulted in good trout growth at the hatcheries. Streamflows also look good for this time of the year, and the outlook for the beginning of trout stocking season (October) is encouraging. All boating access sites across the state have adequate water levels for recreational access.

Reports from the Climatology Office of the University of Virginia, the National Weather Service, the Virginia Department of Environmental Quality, the United States Geological Survey, and the Virginia Department of Agriculture and Consumer Services, follow.

Report of the Climatology Office of the University of Virginia

The first two-thirds of September in Virginia have been very dry with the exception of some areas in the Tidewater. The lowest proportion of normal rainfall has been in the central and northern Valley region.

Although persistent high pressure has helped to suppress precipitation, much of the shortfall can be linked to the lack of tropical cyclone activity. At this time of year, tropical systems (hurricanes, tropical storms, tropical depressions) and their remnants supply a substantial portion of normal precipitation.

Along with lowering sun angles and decreasing day length, the seasonal drop in temperatures from mid-summer is reducing the evaporation rates. This will allow the available rain a better opportunity to soak into the soil. Short-range forecasts (out to two weeks) suggest higher than normal precipitation and lower temperatures throughout Virginia. The longer-range outlooks (one to three months) are clouded by the lack of a strong El Niño signal in the tropical Pacific Ocean, and they give little guidance at this time.

Report of the National Weather Service

A surface front has passed through the area and has settled down into North Carolina. This triggered a few showers and thunderstorms on Wednesday, September 16, 2009. Over the next few days, an upper trough will rotate through the region on Thursday (9/17) which will trigger some showers. With the frontal boundary stalled down to the south, the chance for showers will linger at least into late Friday and early Saturday (9/19) primarily across the southern portions of the state. Drier air will move in sometime on Saturday. Mid-range models have the developing upper trough moving gradually to the east and another slow moving cold front arriving during the first part of the week of September 21st. A chance for intermittent showers could be possible each day until mid-week; however rainfall amounts are uncertain and depends upon the next system's development and movement. The next few days are expected to be mostly cloudy; therefore temperatures are expected to be below normal for the period. The NWS '6 to 10' day outlook calls for above normal precipitation.

United States Geological Survey
Streamflow and Ground Water Levels

Significant portions of the State are showing below normal streamflow conditions. Streamflow gages in the upper James, Shenandoah, and Rappahannock River Basins are recording streamflows that are well below normal. Other areas where streamflow is below normal are the Roanoke and Chowan River Basins (Appendices F and G). Ground-water levels across the State as shown by the Climate-Response well network are recording water levels in the normal range or above except for the well located near Roanoke, Va., which is well below normal (Appendix H).

Virginia Department of Environmental Quality
Conditions of Major Reservoirs

Levels of large reservoirs statewide have continued to drop since mid-August. Four large multi-purpose reservoirs are identified as drought indicators in the *Virginia Drought Assessment and Response Plan* (Plan); Smith Mountain

Lake, Lake Moomaw, Lake Anna and Kerr Reservoir. Of these four reservoirs, Kerr Reservoir is currently in the Drought Watch Stage and the three others are in the Normal Range as defined in the Plan. Below is a summary of reservoir conditions statewide:

- Lake Moomaw on the Jackson River has declined approximately 4.7 feet since August 19th and currently has 52% of its conservation storage remaining.
- Smith Mountain Lake is currently at elevation 793.1 feet (1.9 feet below full) and has dropped approximately 1.4 feet since August 19th. The Drought Watch Stage for Smith Mountain Lake is elevation 793 feet and below.
- Lake Anna is currently at elevation 249.3 feet (0.7 feet below full) and has dropped approximately 0.3 feet since August 19th. The Lake Anna level is approximately average for this time of year based on the last ten years of record.
- Kerr Reservoir is currently 4.15 feet below guide curve which is within the Drought Watch Stage defined in the Plan. The reservoir level has dropped 1.64 feet since August 19th. September inflows into the reservoir have been the 4th lowest (47% of median) based on 79 years of record.
- Phillpott Lake is approximately 1.35 feet below guide curve and has dropped 2.35 feet since August 19th. September inflows into the reservoir have been the 7th lowest in 55 years of record.
- South Holston Lake, straddling the Virginia and Tennessee border, is within the normal range and above the balancing guide. The reservoir level has dropped 5.3 feet since August 19th.
- The two major reservoirs for the Roanoke area, Carvins Cove and Spring Hollow Reservoirs are 2.7 feet and 3.9 feet below full, respectively. These levels correspond to 92% storage remaining at Carvins Cove and 95% storage remaining at Spring Hollow.
- The Rivanna Water and Sewer Authority reservoirs are in good shape for this time of year and are all anticipated to be full by spring.

Virginia Department of Agriculture and Consumer Services
Status of Agricultural Drought

Overview: According to the USDA Crop Weather Report released on September 14, 2009, 63% of topsoil moisture ranged from adequate to surplus. Some areas of the state, such as the Virginia Beach area, experienced heavy rainfall during the first half of September and as a result the harvesting of some crops has been delayed. Other areas of the state, such as Northern Virginia and the Shenandoah Valley, experienced extremely dry weather in late August and early September. Some farmers in eastern Augusta County reported that they are turning in crop insurance claims due to the dry conditions. To date, no Virginia locality has submitted a request seeking agricultural disaster designation for 2009.

Impact on Crops: Overall crop conditions are good around the state. Producers in southwest and southern Virginia are reporting good yields for forage and corn crops. Producers in Virginia Beach are reporting that significant rainfall (6 to 12 inches) in the region in early September is affecting strawberry planting. Farmers in that region need to begin fumigating in preparation for strawberry planting. If farmers are not able to fumigate soon, strawberry yields in the spring could be negatively impacted. The corn crop in the Shenandoah Valley has been particularly affected due to dry conditions in that region.

Impact on Livestock: Pasture conditions vary across the state, but overall pastures are in fair condition. Pasture grazing is still abundant. In the Winchester area, pastures are starting to become very dry as there has been no measurable rainfall in the past six weeks.

Impact on Creeks, Rivers, and Wells: There have been no reports of wells going dry and no water restrictions by municipalities. Creeks and streams are lower than a month ago, but are in better condition than this time last year.

APPENDIX A
Precipitation Departures by Drought Evaluation Region

PRELIMINARY PRECIPITATION SUMMARY

Prepared:
9/21/09

	DROUGHT REGION	OBSERVED	Sep 1, 2009 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	1.01	2.08	-1.06	49%
2	New River	1.41	2.05	-0.63	69%
3	Roanoke	0.69	2.54	-1.85	27%
4	Upper James	0.36	2.10	-1.74	17%
5	Middle James	0.93	2.48	-1.55	38%
6	Shenandoah	0.49	2.20	-1.72	22%
7	Northern Virginia	0.82	2.44	-1.62	34%
8	Northern Piedmont	1.00	2.57	-1.57	39%
9	Chowan	1.68	2.66	-0.97	63%
10	Northern Coastal Plain	0.79	2.45	-1.66	32%
11	York-James	5.87	2.94	2.93	200%
12	Southeast Virginia	5.15	2.66	2.49	194%
13	Eastern Shore	6.17	2.17	4.01	285%
	Statewide	1.25	2.40	-1.15	52%

	DROUGHT REGION	OBSERVED	Aug 1, 2009 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	5.71	5.91	-0.20	97%
2	New River	5.40	5.36	0.04	101%
3	Roanoke	4.59	6.26	-1.67	73%
4	Upper James	3.42	5.43	-2.01	63%
5	Middle James	4.61	6.30	-1.69	73%
6	Shenandoah	3.79	5.53	-1.74	69%
7	Northern Virginia	4.41	6.29	-1.88	70%
8	Northern Piedmont	4.70	6.39	-1.68	74%
9	Chowan	5.35	6.97	-1.62	77%
10	Northern Coastal Plain	3.70	6.31	-2.61	59%
11	York-James	9.59	7.81	1.78	123%
12	Southeast Virginia	14.48	7.78	6.70	186%
13	Eastern Shore	10.46	6.04	4.42	173%
	Statewide	5.16	6.23	-1.07	83%

	DROUGHT REGION	OBSERVED	Jul 1, 2009 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	11.33	10.39	0.94	109%
2	New River	9.57	9.15	0.43	105%
3	Roanoke	8.35	10.65	-2.30	78%
4	Upper James	8.46	9.47	-1.01	89%
5	Middle James	7.91	10.71	-2.80	74%
6	Shenandoah	6.94	9.29	-2.35	75%
7	Northern Virginia	6.16	10.06	-3.90	61%
8	Northern Piedmont	7.53	10.79	-3.26	70%
9	Chowan	9.21	11.48	-2.27	80%
10	Northern Coastal Plain	6.92	10.76	-3.84	64%
11	York-James	17.13	12.91	4.22	133%
12	Southeast Virginia	17.96	12.85	5.11	140%
13	Eastern Shore	16.20	10.04	6.16	161%
	Statewide	9.02	10.57	-1.55	85%

	DROUGHT REGION	OBSERVED	Jun 1, 2009 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	16.61	14.53	2.08	114%
2	New River	14.52	13.00	1.52	112%
3	Roanoke	14.39	14.54	-0.14	99%
4	Upper James	11.93	13.18	-1.25	91%
5	Middle James	12.41	14.22	-1.81	87%
6	Shenandoah	11.74	13.00	-1.26	90%
7	Northern Virginia	11.93	13.92	-2.00	86%
8	Northern Piedmont	13.20	14.80	-1.59	89%
9	Chowan	15.04	15.13	-0.08	99%
10	Northern Coastal Plain	12.06	14.32	-2.26	84%
11	York-James	20.67	16.32	4.35	127%
12	Southeast Virginia	23.03	16.46	6.57	140%
13	Eastern Shore	19.67	13.02	6.66	151%
	Statewide	14.11	14.36	-0.25	98%

	DROUGHT REGION	OBSERVED	May 1, 2009 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	23.22	19.35	3.88	120%
2	New River	22.23	17.21	5.02	129%
3	Roanoke	20.62	18.87	1.75	109%
4	Upper James	18.47	17.46	1.01	106%
5	Middle James	17.94	18.46	-0.52	97%
6	Shenandoah	18.50	16.84	1.66	110%
7	Northern Virginia	19.90	18.26	1.63	109%

8	Northern Piedmont	20.26	19.02	1.24	107%
9	Chowan	20.52	19.22	1.30	107%
10	Northern Coastal Plain	17.01	18.48	-1.47	92%
11	York-James	25.98	20.59	5.39	126%
12	Southeast Virginia	27.96	20.32	7.64	138%
13	Eastern Shore	23.26	16.54	6.73	141%
	Statewide	20.34	18.62	1.72	109%

	DROUGHT REGION	OBSERVED	Apr 1, 2009 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	26.26	23.11	3.15	114%
2	New River	25.12	20.76	4.36	121%
3	Roanoke	23.84	22.67	1.17	105%
4	Upper James	22.01	20.86	1.15	106%
5	Middle James	20.91	21.80	-0.89	96%
6	Shenandoah	21.82	19.76	2.05	110%
7	Northern Virginia	24.03	21.56	2.47	111%
8	Northern Piedmont	23.81	22.31	1.50	107%
9	Chowan	22.62	22.65	-0.03	100%
10	Northern Coastal Plain	19.86	21.57	-1.72	92%
11	York-James	29.52	23.89	5.63	124%
12	Southeast Virginia	30.66	23.57	7.09	130%
13	Eastern Shore	25.78	19.46	6.32	133%
	Statewide	23.43	22.04	1.39	106%

	DROUGHT REGION	OBSERVED	Mar 1, 2009 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	30.56	27.36	3.21	112%
2	New River	29.52	24.43	5.09	121%
3	Roanoke	28.35	26.94	1.41	105%
4	Upper James	25.20	24.65	0.55	102%
5	Middle James	24.96	25.86	-0.89	97%
6	Shenandoah	23.86	22.96	0.90	104%
7	Northern Virginia	26.56	25.22	1.33	105%
8	Northern Piedmont	27.55	26.12	1.44	105%
9	Chowan	28.97	27.02	1.95	107%
10	Northern Coastal Plain	26.28	25.85	0.42	102%
11	York-James	35.53	28.58	6.95	124%
12	Southeast Virginia	36.88	27.77	9.11	133%
13	Eastern Shore	30.69	23.77	6.92	129%
	Statewide	27.77	26.08	1.69	106%

	DROUGHT REGION	OBSERVED	Feb 1, 2009 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	32.66	30.94	1.73	106%
2	New River	30.67	27.36	3.31	112%
3	Roanoke	29.41	30.25	-0.84	97%
4	Upper James	26.13	27.50	-1.37	95%
5	Middle James	25.57	28.98	-3.41	88%
6	Shenandoah	24.35	25.37	-1.02	96%
7	Northern Virginia	27.01	27.89	-0.88	97%
8	Northern Piedmont	28.11	29.09	-0.97	97%
9	Chowan	29.76	30.19	-0.43	99%
10	Northern Coastal Plain	26.61	28.99	-2.39	92%
11	York-James	36.47	32.11	4.36	114%
12	Southeast Virginia	37.84	31.27	6.57	121%
13	Eastern Shore	31.07	26.96	4.12	115%
	Statewide	28.66	29.21	-0.55	98%

	DROUGHT REGION	OBSERVED	Jan 1, 2009 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	38.22	34.67	3.55	110%
2	New River	34.17	30.57	3.60	112%
3	Roanoke	32.78	34.17	-1.39	96%
4	Upper James	29.23	30.78	-1.55	95%
5	Middle James	27.81	32.64	-4.83	85%
6	Shenandoah	26.51	28.22	-1.71	94%
7	Northern Virginia	29.54	31.17	-1.63	95%
8	Northern Piedmont	30.31	32.61	-2.30	93%
9	Chowan	31.87	34.30	-2.43	93%
10	Northern Coastal Plain	28.52	32.74	-4.22	87%
11	York-James	38.37	36.25	2.11	106%
12	Southeast Virginia	39.86	35.43	4.43	113%
13	Eastern Shore	32.90	30.52	2.38	108%
	Statewide	31.52	32.85	-1.33	96%

	DROUGHT REGION	OBSERVED	Dec 1, 2008 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	43.05	38.31	4.74	112%
2	New River	37.52	33.28	4.24	113%
3	Roanoke	36.51	37.42	-0.91	98%
4	Upper James	32.68	33.73	-1.05	97%
5	Middle James	31.76	35.81	-4.05	89%
6	Shenandoah	30.14	30.81	-0.67	98%
7	Northern Virginia	32.55	34.27	-1.73	95%

8	Northern Piedmont	33.87	35.89	-2.01	94%
9	Chowan	35.74	37.32	-1.58	96%
10	Northern Coastal Plain	31.48	36.02	-4.54	87%
11	York-James	42.47	39.64	2.83	107%
12	Southeast Virginia	43.69	38.61	5.08	113%
13	Eastern Shore	38.05	33.76	4.29	113%
	Statewide	35.29	35.97	-0.68	98%

	DROUGHT REGION	OBSERVED	Nov 1, 2008 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	45.60	41.59	4.01	110%
2	New River	39.19	36.31	2.88	108%
3	Roanoke	39.50	40.78	-1.28	97%
4	Upper James	35.09	37.09	-2.00	95%
5	Middle James	34.86	39.32	-4.46	89%
6	Shenandoah	32.03	33.86	-1.83	95%
7	Northern Virginia	34.62	37.68	-3.06	92%
8	Northern Piedmont	36.24	39.69	-3.45	91%
9	Chowan	38.98	40.43	-1.45	96%
10	Northern Coastal Plain	35.08	39.16	-4.08	90%
11	York-James	46.83	43.01	3.82	109%
12	Southeast Virginia	48.66	41.68	6.98	117%
13	Eastern Shore	42.77	36.70	6.07	117%
	Statewide	38.10	39.20	-1.10	97%

	DROUGHT REGION	OBSERVED	Oct 1, 2008 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	47.37	44.47	2.90	107%
2	New River	40.38	39.48	0.91	102%
3	Roanoke	41.28	44.49	-3.20	93%
4	Upper James	36.49	40.34	-3.85	90%
5	Middle James	36.45	43.16	-6.70	84%
6	Shenandoah	33.66	37.05	-3.40	91%
7	Northern Virginia	36.10	41.16	-5.06	88%
8	Northern Piedmont	37.88	43.68	-5.80	87%
9	Chowan	40.42	44.01	-3.59	92%
10	Northern Coastal Plain	36.62	42.67	-6.05	86%
11	York-James	48.52	46.54	1.98	104%
12	Southeast Virginia	50.15	45.34	4.81	111%
13	Eastern Shore	43.88	39.91	3.97	110%
	Statewide	39.67	42.70	-3.03	93%

	DROUGHT REGION	OBSERVED	Sep 1, 2008 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	49.45	47.93	1.52	103%
2	New River	42.92	42.89	0.04	100%
3	Roanoke	45.62	48.72	-3.10	94%
4	Upper James	38.63	43.84	-5.21	88%
5	Middle James	41.66	47.29	-5.62	88%
6	Shenandoah	37.40	40.72	-3.32	92%
7	Northern Virginia	41.86	45.23	-3.37	93%
8	Northern Piedmont	43.19	47.96	-4.76	90%
9	Chowan	47.04	48.44	-1.40	97%
10	Northern Coastal Plain	41.68	46.76	-5.09	89%
11	York-James	54.44	51.44	3.00	106%
12	Southeast Virginia	57.89	49.77	8.12	116%
13	Eastern Shore	47.99	43.52	4.48	110%
	Statewide	44.09	46.70	-2.61	94%

	DROUGHT REGION	OBSERVED	Aug 1, 2008 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	53.52	51.76	1.77	103%
2	New River	47.39	46.20	1.20	103%
3	Roanoke	50.26	52.44	-2.17	96%
4	Upper James	42.72	47.17	-4.45	91%
5	Middle James	46.46	51.11	-4.65	91%
6	Shenandoah	40.92	44.05	-3.13	93%
7	Northern Virginia	43.90	49.08	-5.18	89%
8	Northern Piedmont	46.29	51.78	-5.49	89%
9	Chowan	50.06	52.75	-2.69	95%
10	Northern Coastal Plain	43.98	50.62	-6.64	87%
11	York-James	57.08	56.31	0.77	101%
12	Southeast Virginia	60.12	54.89	5.23	110%
13	Eastern Shore	50.91	47.39	3.52	107%
	Statewide	47.84	50.53	-2.69	95%

	DROUGHT REGION	OBSERVED	Jul 1, 2008 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	58.24	56.24	2.01	104%
2	New River	51.32	49.99	1.33	103%
3	Roanoke	53.69	56.83	-3.14	94%
4	Upper James	46.82	51.21	-4.39	91%
5	Middle James	50.29	55.52	-5.22	91%
6	Shenandoah	45.23	47.81	-2.58	95%
7	Northern Virginia	46.86	52.85	-5.99	89%

8	Northern Piedmont	50.13	56.18	-6.04	89%
9	Chowan	53.48	57.26	-3.77	93%
10	Northern Coastal Plain	47.50	55.07	-7.57	86%
11	York-James	60.80	61.41	-0.61	99%
12	Southeast Virginia	65.80	59.96	5.84	110%
13	Eastern Shore	54.81	51.39	3.43	107%
	Statewide	51.74	54.87	-3.13	94%

	DROUGHT REGION	OBSERVED	Jun 1, 2008 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	61.78	60.38	1.41	102%
2	New River	53.80	53.84	-0.04	100%
3	Roanoke	56.60	60.72	-4.12	93%
4	Upper James	49.42	54.92	-5.50	90%
5	Middle James	52.41	59.03	-6.62	89%
6	Shenandoah	49.12	51.52	-2.41	95%
7	Northern Virginia	51.50	56.71	-5.21	91%
8	Northern Piedmont	55.39	60.19	-4.80	92%
9	Chowan	55.20	60.91	-5.71	91%
10	Northern Coastal Plain	51.94	58.63	-6.70	89%
11	York-James	62.93	64.82	-1.89	97%
12	Southeast Virginia	67.71	63.57	4.14	107%
13	Eastern Shore	59.37	54.37	5.00	109%
	Statewide	54.84	58.66	-3.82	93%

	DROUGHT REGION	OBSERVED	May 1, 2008 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	64.36	65.20	-0.84	99%
2	New River	56.37	58.05	-1.67	97%
3	Roanoke	60.45	65.05	-4.60	93%
4	Upper James	52.78	59.20	-6.42	89%
5	Middle James	56.63	63.27	-6.64	90%
6	Shenandoah	53.65	55.36	-1.71	97%
7	Northern Virginia	59.96	61.05	-1.10	98%
8	Northern Piedmont	61.58	64.41	-2.83	96%
9	Chowan	58.60	65.00	-6.40	90%
10	Northern Coastal Plain	58.19	62.79	-4.61	93%
11	York-James	65.69	69.09	-3.40	95%
12	Southeast Virginia	71.49	67.43	4.06	106%
13	Eastern Shore	64.67	57.89	6.78	112%
	Statewide	59.05	62.92	-3.87	94%

	DROUGHT REGION	OBSERVED	Apr 1, 2008 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	68.68	68.96	-0.27	100%
2	New River	61.16	61.60	-0.43	99%
3	Roanoke	65.84	68.85	-3.01	96%
4	Upper James	57.61	62.60	-4.99	92%
5	Middle James	62.83	66.61	-3.78	94%
6	Shenandoah	59.05	58.28	0.77	101%
7	Northern Virginia	65.62	64.35	1.27	102%
8	Northern Piedmont	67.60	67.70	-0.10	100%
9	Chowan	65.81	68.43	-2.62	96%
10	Northern Coastal Plain	64.15	65.88	-1.74	97%
11	York-James	72.00	72.39	-0.39	99%
12	Southeast Virginia	78.17	70.68	7.49	111%
13	Eastern Shore	69.10	60.81	8.29	114%
	Statewide	64.68	66.34	-1.66	97%

	DROUGHT REGION	OBSERVED	Mar 1, 2008 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	73.06	73.21	-0.15	100%
2	New River	63.80	65.27	-1.47	98%
3	Roanoke	69.05	73.12	-4.07	94%
4	Upper James	60.43	66.39	-5.96	91%
5	Middle James	66.12	70.67	-4.55	94%
6	Shenandoah	61.85	61.48	0.37	101%
7	Northern Virginia	68.06	68.01	0.05	100%
8	Northern Piedmont	70.70	71.51	-0.81	99%
9	Chowan	69.72	72.80	-3.07	96%
10	Northern Coastal Plain	66.63	70.16	-3.54	95%
11	York-James	75.84	77.08	-1.25	98%
12	Southeast Virginia	81.10	74.88	6.22	108%
13	Eastern Shore	70.88	65.12	5.76	109%
	Statewide	67.86	70.38	-2.52	96%

	DROUGHT REGION	OBSERVED	Feb 1, 2008 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	76.26	76.79	-0.53	99%
2	New River	65.81	68.20	-2.38	97%
3	Roanoke	71.33	76.43	-5.10	93%
4	Upper James	62.64	69.24	-6.60	90%
5	Middle James	68.77	73.79	-5.02	93%
6	Shenandoah	64.15	63.89	0.26	100%
7	Northern Virginia	70.85	70.68	0.17	100%

8	Northern Piedmont	73.34	74.48	-1.14	98%
9	Chowan	72.57	75.97	-3.40	96%
10	Northern Coastal Plain	69.19	73.30	-4.11	94%
11	York-James	79.14	80.61	-1.47	98%
12	Southeast Virginia	85.22	78.38	6.84	109%
13	Eastern Shore	74.18	68.31	5.87	109%
	Statewide	70.50	73.51	-3.01	96%

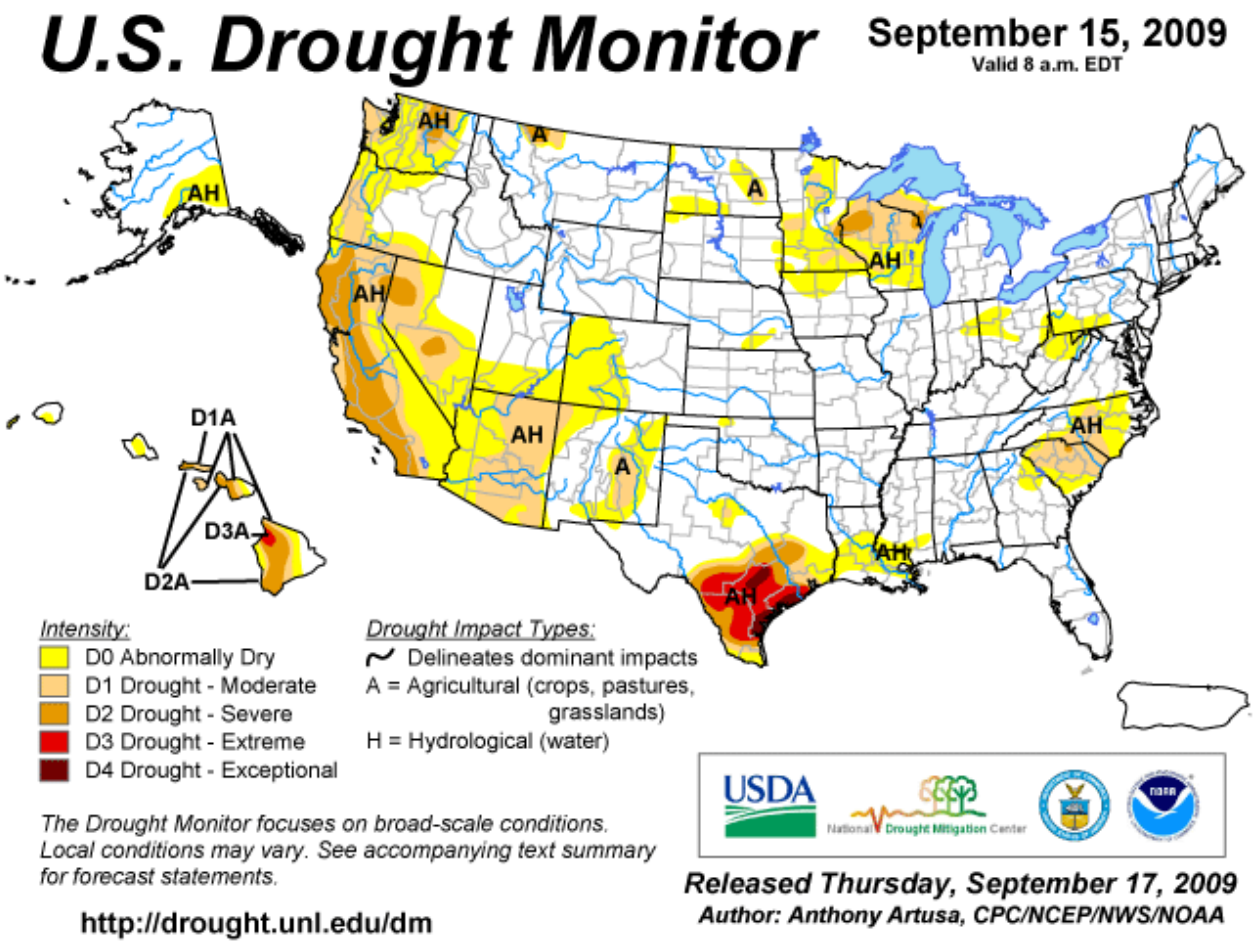
	DROUGHT REGION	OBSERVED	Jan 1, 2008 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	79.24	80.52	-1.28	98%
2	New River	67.09	71.41	-4.32	94%
3	Roanoke	72.22	80.35	-8.13	90%
4	Upper James	64.28	72.52	-8.24	89%
5	Middle James	69.82	77.45	-7.63	90%
6	Shenandoah	65.16	66.74	-1.58	98%
7	Northern Virginia	72.05	73.96	-1.91	97%
8	Northern Piedmont	74.41	78.00	-3.59	95%
9	Chowan	73.64	80.08	-6.44	92%
10	Northern Coastal Plain	70.35	77.05	-6.70	91%
11	York-James	81.85	84.75	-2.91	97%
12	Southeast Virginia	86.63	82.54	4.09	105%
13	Eastern Shore	76.12	71.87	4.25	106%
	Statewide	71.86	77.15	-5.29	93%

	DROUGHT REGION	OBSERVED	Dec 1, 2007 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	82.53	84.16	-1.63	98%
2	New River	69.69	74.12	-4.43	94%
3	Roanoke	75.52	83.60	-8.08	90%
4	Upper James	67.58	75.47	-7.89	90%
5	Middle James	73.03	80.62	-7.59	91%
6	Shenandoah	68.19	69.33	-1.14	98%
7	Northern Virginia	75.04	77.06	-2.02	97%
8	Northern Piedmont	77.76	81.28	-3.52	96%
9	Chowan	77.89	83.10	-5.21	94%
10	Northern Coastal Plain	73.47	80.33	-6.87	91%
11	York-James	85.96	88.14	-2.19	98%
12	Southeast Virginia	90.48	85.72	4.76	106%
13	Eastern Shore	80.81	75.11	5.71	108%
	Statewide	75.19	80.27	-5.08	94%

	DROUGHT REGION	OBSERVED	Nov 1, 2007 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	84.70	87.44	-2.74	97%
2	New River	70.25	77.15	-6.89	91%
3	Roanoke	76.09	86.96	-10.87	87%
4	Upper James	68.61	78.83	-10.22	87%
5	Middle James	73.69	84.13	-10.43	88%
6	Shenandoah	69.56	72.38	-2.82	96%
7	Northern Virginia	76.54	80.47	-3.93	95%
8	Northern Piedmont	78.97	85.08	-6.11	93%
9	Chowan	78.52	86.21	-7.69	91%
10	Northern Coastal Plain	74.74	83.47	-8.74	90%
11	York-James	86.76	91.51	-4.76	95%
12	Southeast Virginia	91.04	88.79	2.26	103%
13	Eastern Shore	81.83	78.05	3.78	105%
	Statewide	76.20	83.50	-7.30	91%

	DROUGHT REGION	OBSERVED	Oct 1, 2007 NORMAL	- Sep 18, 2009 DEPARTURE	% OF NORM.
1	Big Sandy	87.38	90.32	-2.93	97%
2	New River	76.37	80.32	-3.95	95%
3	Roanoke	81.82	90.67	-8.84	90%
4	Upper James	72.64	82.08	-9.44	89%
5	Middle James	78.69	87.97	-9.28	89%
6	Shenandoah	72.99	75.57	-2.58	97%
7	Northern Virginia	80.77	83.95	-3.19	96%
8	Northern Piedmont	83.45	89.07	-5.61	94%
9	Chowan	83.36	89.79	-6.43	93%
10	Northern Coastal Plain	79.66	86.98	-7.33	92%
11	York-James	91.29	95.04	-3.76	96%
12	Southeast Virginia	96.21	92.45	3.76	104%
13	Eastern Shore	85.51	81.26	4.26	105%
	Statewide	80.82	87.00	-6.18	93%

APPENDIX B


U.S. Drought Monitor
September 15, 2009
Valid 8 a.m. EDT
AH
A
D1A
D3A
D2A
Intensity:
D0 Abnormally Dry
D1 Drought - Moderate
D2 Drought - Severe
D3 Drought - Extreme
D4 Drought - Exceptional
Drought Impact Types:
Delineates dominant impacts
A = Agricultural (crops, pastures, grasslands)
H = Hydrological (water)
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.
http://drought.unl.edu/dm
USDA
National Drought Mitigation Center
Released Thursday, September 17, 2009
Author: Anthony Artusa, CPC/NCEP/NWS/NOAA

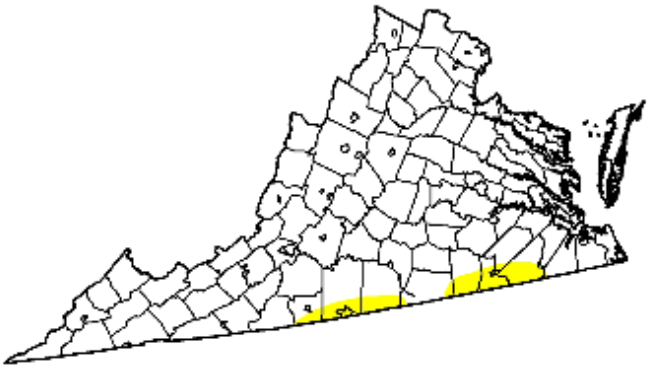
APPENDIX C

U.S. Drought Monitor
Virginia

September 15, 2009
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	95.9	4.1	0.0	0.0	0.0	0.0
Last Week (09/08/2009 map)	95.9	4.1	0.0	0.0	0.0	0.0
3 Months Ago (06/23/2009 map)	99.7	0.3	0.0	0.0	0.0	0.0
Start of Calendar Year (01/06/2009 map)	63.0	37.0	24.7	0.0	0.0	0.0
Start of Water Year (10/07/2008 map)	57.8	42.2	25.1	1.6	0.0	0.0
One Year Ago (09/16/2008 map)	50.1	49.9	28.7	2.9	0.0	0.0



Intensity:

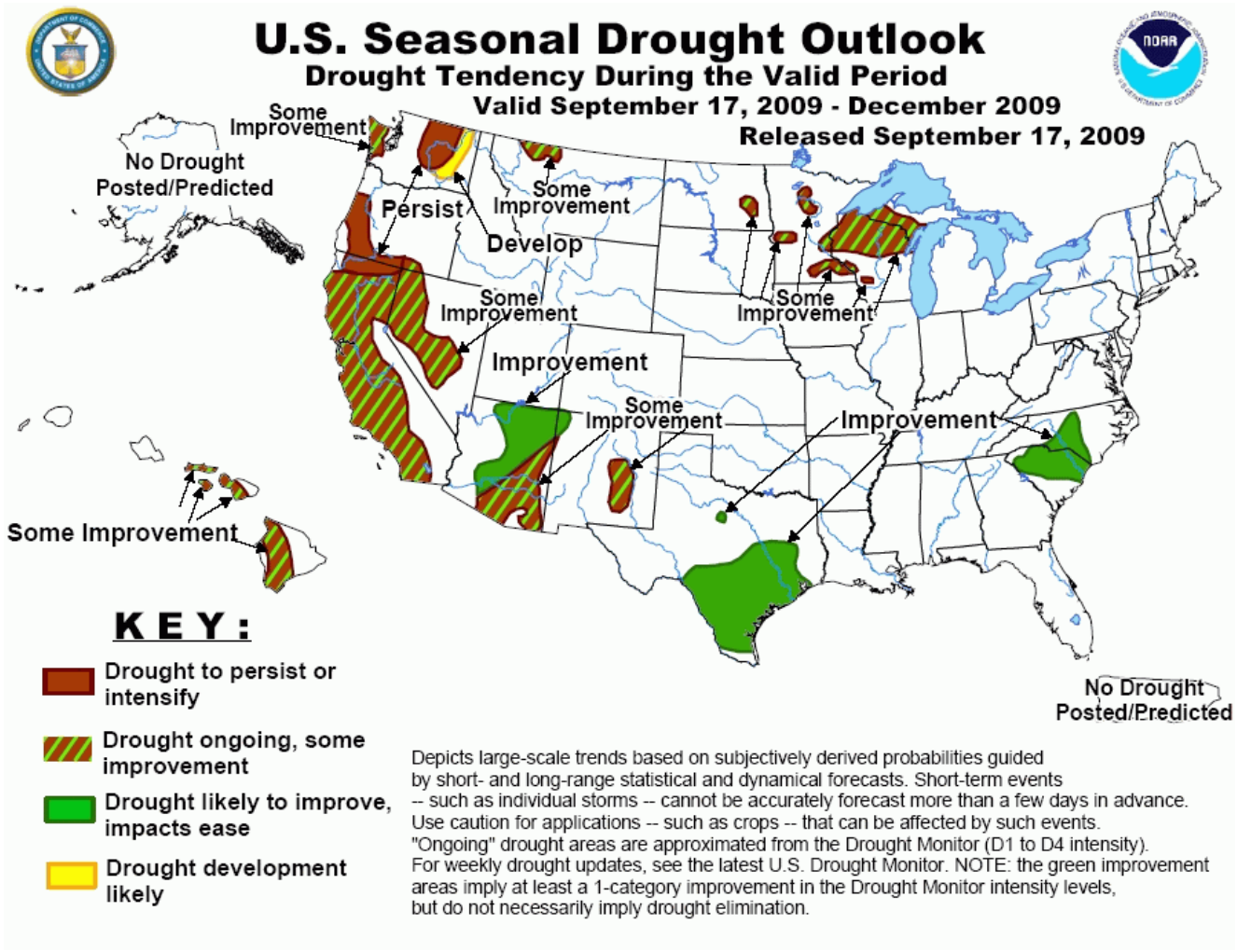
- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements

http://drought.unl.edu/dm

Released Thursday, September 17, 2009
Author: Anthony Artusa, CPC/NOAA

APPENDIX D


U.S. Seasonal Drought Outlook
Drought Tendency During the Valid Period
Valid September 17, 2009 - December 2009
Released September 17, 2009
Some Improvement
No Drought Posted/Predicted
Persist
Develop
Some Improvement
Some Improvement
Some Improvement
Improvement
Some Improvement
Improvement
Some Improvement
No Drought Posted/Predicted
KEY:
Drought to persist or intensify
Drought ongoing, some improvement
Drought likely to improve, impacts ease
Drought development likely
Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor. NOTE: the green improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.

APPENDIX E
Condition of Public Water Supplies
September 4, 2009

ODW Drought Situation Report

Date: **9/4/09**

	Restriction totals
Mandatory	2
Voluntary	22
Total	**24**

N-None
M-Mandatory
V-Voluntary

B-Better
S-Stable/Same
W-Worse

PWSID	Waterworks	Source Name	Restrictions	Situation	Population Served
3053280	DCWA Central (Dinwiddie County)	Appomattox River Water Authority (ARWA)	V	S - 09/02/09 - Voluntary restrictions began on 7/29/08. ARWA lifted voluntary restrictions September 2008. No formal action taken to rescind voluntary restrictions in Dinwiddie County to date.	6,800
3081550	GCWSA - Jarratt	Nottoway River	N	S - 09/01/09 - Waterworks production rate reduced due to lower demand; river level sufficient to allow plant operation at 2.0 mgd.	7,190
3093120	Isle of Wight County	Suffolk	V	B - 09/02/09 - Obtains water from Suffolk. Follows Suffolk's lead on conservation.	1,284
3550050	Chesapeake - Western Branch system	City of Portsmouth	V	S -09/02/09 This portion of the city is consecutive to (receives water from) the city of Portsmouth. City Council voted to go to voluntary conservation city-wide - it took effect on 24 Oct 2007. Still following Portsmouth's lead on conservation.	36,404

3550051	Chesapeake	Northwest River, City of Norfolk Raw Water (Lake Gaston)	V	B - 09/02/09 Chesapeake is in good shape. There is no active water use restriction in place. For the past eight month greater than average rainfall levels observed. There is a surplus of 6.44 inch. Chlorides are used as an indicator of drought, the higher the levels the more concentrated the contaminant in a lesser amount of surface water. The chlorides remain slightly elevated in the NWR. Current levels are in the range of 40-50 mg/l. The average since June was 63 mg/l. Continuing to purchase raw water from Norfolk (7.0 MGD average)	102,292
3550052	Chesapeake - South Norfolk system	City of Norfolk	V	S -09/02/09-This portion of the city is consecutive to (receives water from) the city of Norfolk. City Council voted to go to voluntary conservation city-wide - it took effect on 24 Oct 2007. Still following Norfolk's lead on conservation.	38,706
3570150	Colonial Heights	ARWA	V	S - 09/02/09 - Lifted mandatory restrictions on 12/1/07. Voluntary restrictions currently in place.	17,286
3595250	Emporia	Meherrin River	N	S - 09/02/09 - Water flowing over dam, reservoir level sufficient for normal operation.	5,600
3670800	Virginia-American Water Company (Hopewell)	Appomattox & James Rivers	N	S - 09/03/2009 - Level at intakes still sufficient to supply plant. August rainfall slightly below monthly and yearly averages.	25000 - Primary / 42463 Total including Consecutive System (Ft. Lee)
3700500	Newport News	Chickahomony River, Skiffs Creek, Diascand, Little Creek, Harwoods Mill, Lee Hall	N	B -- 08/30/09 - Total reservoir capacity at 90.26%. This is up from 2008 (73%) and 2007 (87%). Some of the current "emptiness" is the	406,000

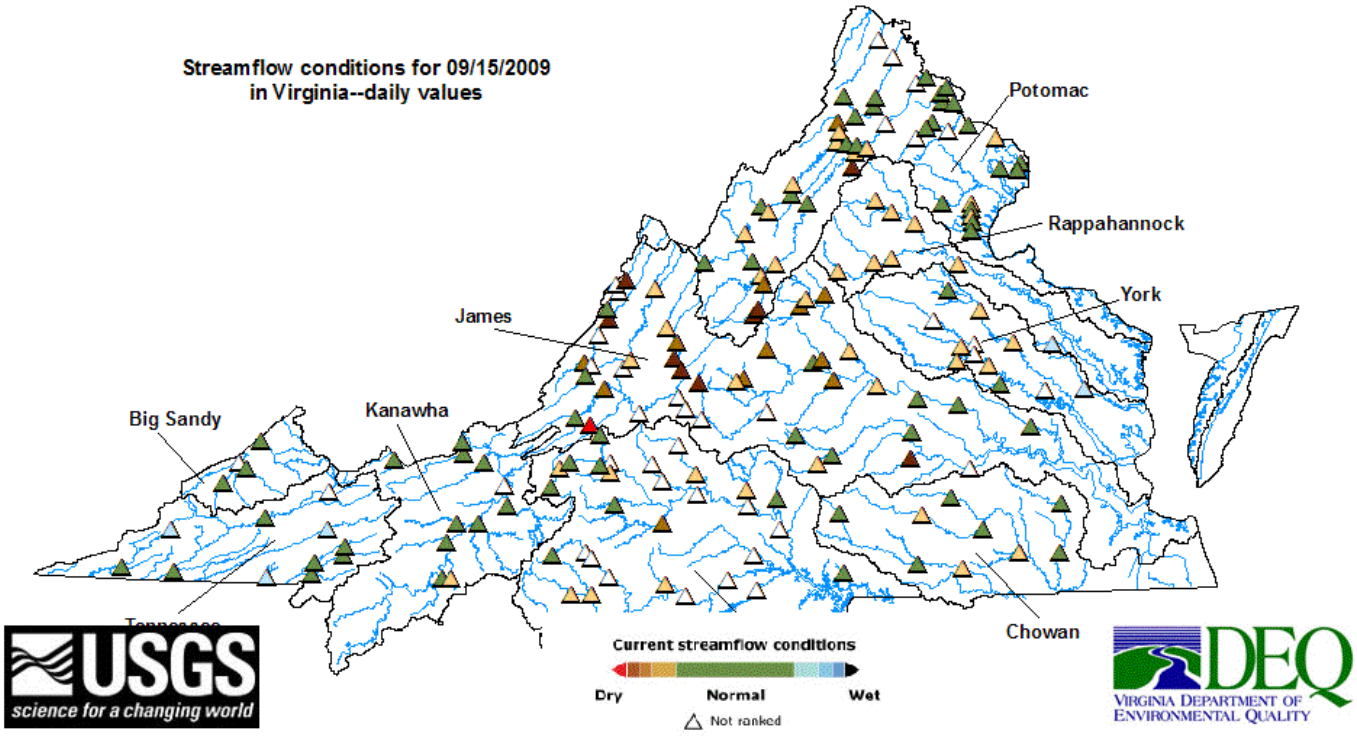
				intentional lowering of one of the impoundments for work on the dam. Last report was 89.5%	
3710100	Norfolk	Lake Prince, Lake Burnt Mills, Western Branch reservoir, Nottoway River, Blackwater River, 4 western wells; Little Creek reservoir, Lakes Smith, Lawson, Whitehurst, and Wright. Lake Gaston.	V	B - As of 08/24/09 (latest data), reservoirs at 88.3% (up from from 84% on 08/03/09). Historic reservoir capacity is 86.3% at this time of year. Avg. pumping from Lake Gaston = 48.2 MGD. Called for voluntary conservation 11/1/07.	261,250 - Primary / 755,617 - Total including consecutive systems (Va Beach + military bases).
3740600	Portsmouth	Lakes Cohoon, Meade, Kilby, and Speights Run	V	S - As of 08/28/09, reservoirs at 96% (from 95% on 08/07/09). Median reservoir capacity is 94% for the month and historical average capacity is 90% (period of 1969-2008). The emergency wells are off. Called for voluntary conservation on 10/10/07.	100,400 - Primary / 120,400 Total including consecutive systems (military bases)
3800805	Suffolk	Lone Star Lakes, Cumps Mill Pond	V	B -09/02/09-Will follow Portsmouth's lead and the region as far as conservation. Average reservoir levels : Southern Lakes at 72.06.0% capacity, for the Northern Lakes at 97.61% and Crumps Mill Pond at 95.85% The Southern Lakes are for emergency use only. Overall they are at 92.66% capacity for the reservoirs for the period (June-August 2009). The operator states that thiey are in better condition this year when compared to 2008 (73.50%) for the same period. Still purchasing water from Portsmouth per their contract, no drought measure taken to date.	62,562
3810900	Virginia Beach	Norfolk	V	B - 08/24/09 - Obtains water from Norfolk. Called for voluntary conservation on 9/19/07.	423,743

3830850	Williamsburg	Waller Mill Reservoir	N	W (than last month, but in line with historic situation) - 09/01/09: 8" below primary spillway - about 84% capacity. The average level over the past 10 years is 9 inches below the spillway. Last month was 1.5 inches.	16,400
4041035	APPOMATTOX RIVER WATER AUTHORITY	Surface water; Lake Chesdin	N	S- Wholesaler to Chesterfield County, Prince George County, Dinwiddie County; Cities of Petersburg and Colonial Heights. Reservoir is at full level.	200,000
4041845	CHESTERFIELD CO CENTRAL WATER SYSTEM	Surface water; Swift Creek reservoir; purchases finished water	N	S- Purchases water from the City of Richmond and the Appomattox River Water Authority. Reservoir is at full level.	286,000
4057800	TAPPAHANNOCK, TOWN OF	Groundwater wells	N	S	2,100
4073311	GLOUCESTER CO WATER TREATMENT PLT	Surface water, Beaverdam reservoir; 2 deep groundwater wells	N	S-Reservoir is full.	8,870
4075283	EASTERN GOOCHLAND CENTRAL WATER SYSTEM	Purchased surface water	N	S-purchases water from Henrico County	2,500
4075735	JAMES RIVER CORRECTIONAL CTR	Surface water; James River	V	S- Conservation at all DOC facilities	9,300
4085398	HANOVER SUBURBAN WATER SYSTEM	Surface water; North Anna River; some groundwater wells; purchases finished water	V	S (see Richmond)	71,000
4085770	SPRING MEADOWS-MEADOW GATE	Groundwater wells	N	S- A replacement well has been drilled and other improvements are proposed in the PER.	2,300
4087125	HENRICO COUNTY WATER SYSTEM	Surface water; James River	V	S (see Richmond)	289,000
4101900	WEST POINT, TOWN OF	Groundwater wells	N	S	3,000
4127110	DELMARVA PROPERTIES	Groundwater wells	V	S-New Kent Co. encourages conservation at all county owned waterworks.	7,700
4145675	POWHATAN COURTHOUSE	Groundwater wells	N	S	2,600
4193280	COLONIAL BEACH, TOWN OF	Groundwater wells	N	S	3,300

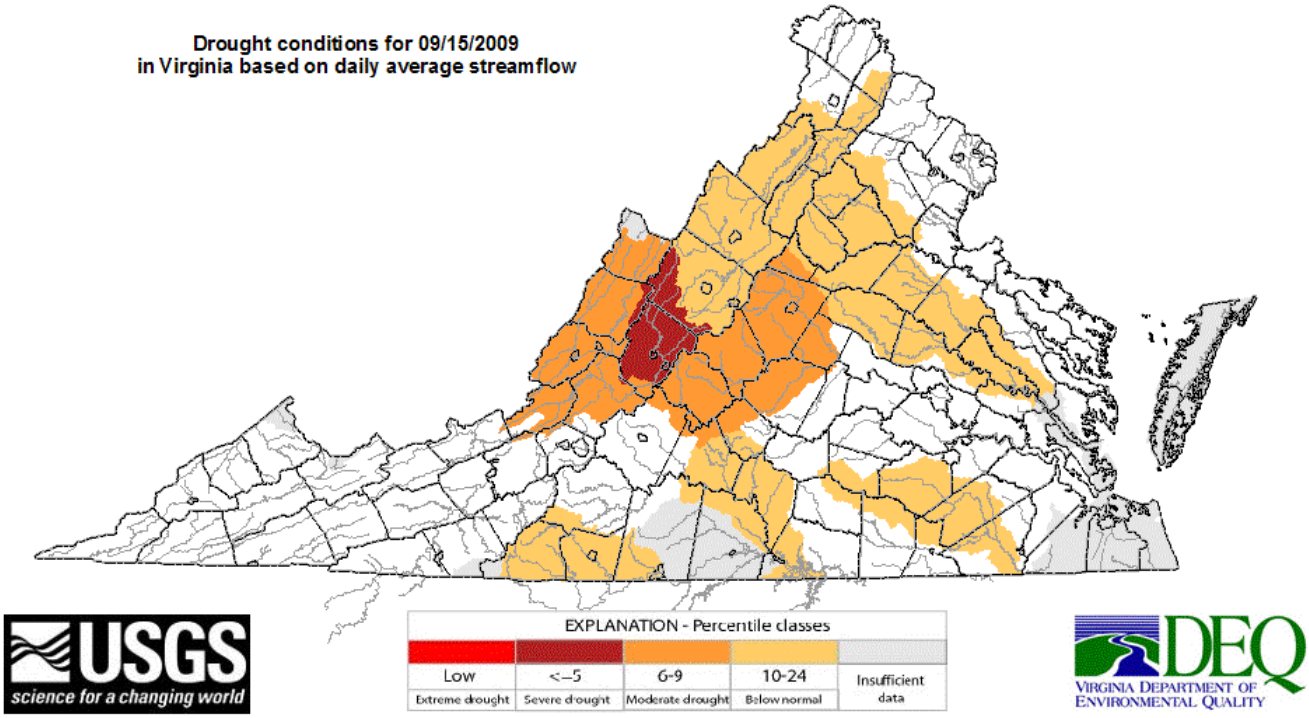
4760100	RICHMOND, CITY OF	Surface water; James River	V	S- water levels do not affect intake; James River Regional Flow Management Plan set restrictions based on James River level for counties of Henrico, Chesterfield, Goochland, and Hanover counties, which purchase water from the City.	197,000
5143210	Town of Gretna	Georges Creek Res	N	S	2,500
5029085	Buckingham County	Troublesome Creek Reservoir	N	S- water levels over spillway are sufficient	5,751
5037300	Town of Keysville	Keysville Reservoir	N	S	800
5780600	HCSA-South Boston	Dan River	N	S	11,388
5141640	Town of Stuart	South Mayo River	N	S	1,500
5147170	Town of Farmville	Appomattox River	N	S -river level at normal height	7,011
5011050	Town of Appomattox	Wells	V	S	1,708
5067265	Hales Point	Wells	N	S - hauling water	46
5067348	Westlake Water Co	Wells	V	S - hauling water	620
5690400	City of Martinsville	Beaver Creek Reservoir	N	S - reservoir 10 incles below spillway as of 8/17/09	16,000
6061200	Marshall	Groundwater	M	S - The WSA Alert Messaging Service maintains the Water Use Restriction Notice as of 9/3/2009. The mandatory water use restriction is not directly drought related but depends on water source development.	2,134
6107150	Town of Hamilton	Groundwater	V	S - 9/3/09 No water supply problems. Voluntary water use restrictions until new Well 14 is placed in service.	2,000
6107200	Town of Hillsboro	Spring/Well	V	S - 9/3/09 Combined yield from new well and spring has not been consistently adequate to meet current demand. A leak survey revealed 10 potential leaks in the distribution system.	58
6107601	LCSA Raspberry Falls Subdivision	Groundwater	V	S -9/3/09 Both wells in service. No problems with water supply - quantity. Voluntary conservation in place beginning 3/11/08.	400
6107400	Town of Lovettsville	Groundwater	V	S -9/3/09 Voluntary water use restrictions remain in	1,280

				place; however there is no problem with water supply.	
6107650	Town of Round Hill	Groundwater	V	S - 9/3/09 - No water supply problems.Voluntary water use restrictions replace mandatory water use restrictions on 4/1/08.	3,156
6153260	Woodbridge Mobile Home Park	Groundwater	M	S -- 9/3/09 Low water pressure problem continues. Waterworks continues to have low pressure due to inadequate sources and leaks in the distribution system. This problem is indirectly related to drought as source problems existed previously. A new well was drilled in November 2008. Developmental Testing completed in December 2008, all water quality results reviewed by VDH ODW. Plans for connecting new well to waterworks have been reviewed and comments issued to owner.	320

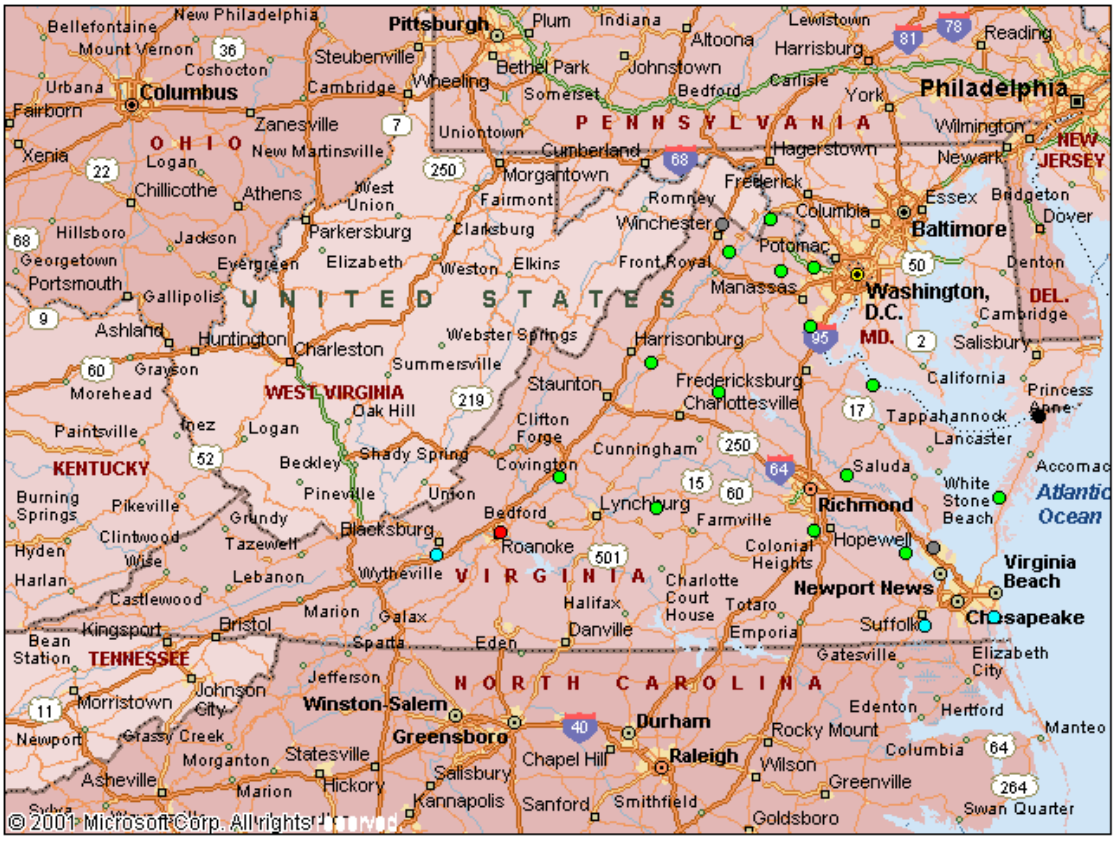
APPENDIX F


Streamflow conditions for 09/15/2009
in Virginia--daily values
Potomac
Rappahannock
York
James
Big Sandy
Kanawha
Chowan
Current streamflow conditions
Dry
Normal
Wet
Not ranked
USGS
science for a changing world
DEQ
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

APPENDIX G
Drought Watch -- USGS State Information on Drought
Map of below normal 7-day average streamflow



APPENDIX H
Virginia Climate Response Network
September 16, 2009



Explanation - Percentile classes (symbol color based on most recent measurement)							
New Low	<10 Much Below Normal	10-24 Below Normal	25-75 Normal	76-90 Above Normal	>90 Much Above Normal	New High	Not Ranked

Map generated 9/16/2009 9:52:48 AM